Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

230. Proposed by G. W. GREENWOOD, M. A. (Oxon), Lebanon, Ill.

Find the value of the determinant of n rows,

$$\left|\begin{array}{cccccc} 5 & 2 & 0 & 0 & 0 & \cdots\cdots \\ 2 & 5 & 2 & 0 & 0 & \cdots\cdots \\ 0 & 2 & 5 & 2 & 0 & \cdots\cdots \\ 0 & 0 & 2 & 5 & 2 & \cdots\cdots \\ 0 & 0 & 0 & 2 & 5 & \cdots\cdots \\ \cdots & \cdots & \cdots & \cdots & \cdots & \cdots\cdots \end{array}\right|$$

[Oxford, 1900.]

Solution by the PROPOSER.

Denote the determinant by u_n. Then $u_n = 5u_{n-1} - 4u_{n-2}$.
Let $S = u_1 + u_2x^2 + u_3x^2 + \cdots\cdots$ Then

$$(1-5x+4x^2)S = u_1 + (u_2 - 5u_1)x = 5 - 4x.$$

$$S = \frac{5-4x}{1-5x+4x^2} = \tfrac{1}{3}\left[\frac{16}{1-4x} - \frac{1}{1-x}\right].$$

Then $u_n = \text{co}\, x^{n-1}$ in $S = \frac{1}{3}[4^{n+1} - 1]$.

Also solved by M. E. Graber.

231. Proposed by O. L. CALLECOT, Omaha, Neb.

Sum to infinity: $\dfrac{1}{2.3.4} + \dfrac{1}{5.6.7} + \dfrac{1}{8.9.10} + \cdots\cdots$

Remark by Editor EPSTEEN.

Mr. A. H. Holmes notes that

$$\frac{2}{(2+x)(2+x+1)(2+x+2)} = \frac{1}{2+x} - \frac{2}{2+x+1} + \frac{1}{2+x+2}$$

and then substitutes $x = 0, 1, 2, \cdots\cdots$ From this point on it seems to me that his solution should proceed thus:

$$\frac{1}{1.2.3} + \frac{1}{5.6.7} + \frac{1}{8.9.10} + \cdots\cdots$$

$$\begin{array}{l} = \frac{1}{2} - \frac{2}{3} + \frac{1}{4} \\ \qquad + \frac{1}{3} - \frac{2}{4} + \frac{1}{5} \\ \qquad\qquad + \frac{1}{4} - \frac{2}{5} + \frac{1}{6} \\ \qquad\qquad\qquad + \frac{1}{5} - \frac{2}{6} + \frac{1}{7} \\ \qquad\qquad\qquad\quad\ \vdots \qquad\quad \vdots \end{array}$$

$= \frac{1}{2} - \frac{1}{3} = \frac{1}{6}$.

232. Proposed by F. P. MATZ, Sc. D., Ph. D., Reading, Pa.

If one person out of 50 die annually and one person out of 30 is born annually, how long at this rate would be required for the population to treble itself?